

Wilo-Control ESK, PSK



de Einbau- und Betriebsanleitung
en Installation and operating instructions
fr Notice de montage et de mise en service
es Instrucciones de instalación y funcionamiento

it Istruzioni di montaggio, uso e manutenzione
ru Инструкция по монтажу и эксплуатации

Fig. 1:

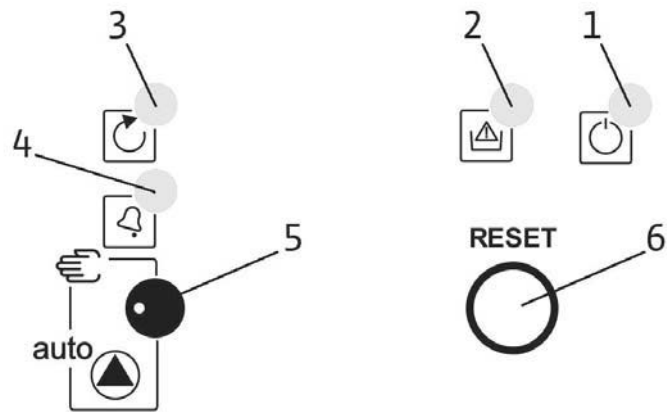


Fig. 2:

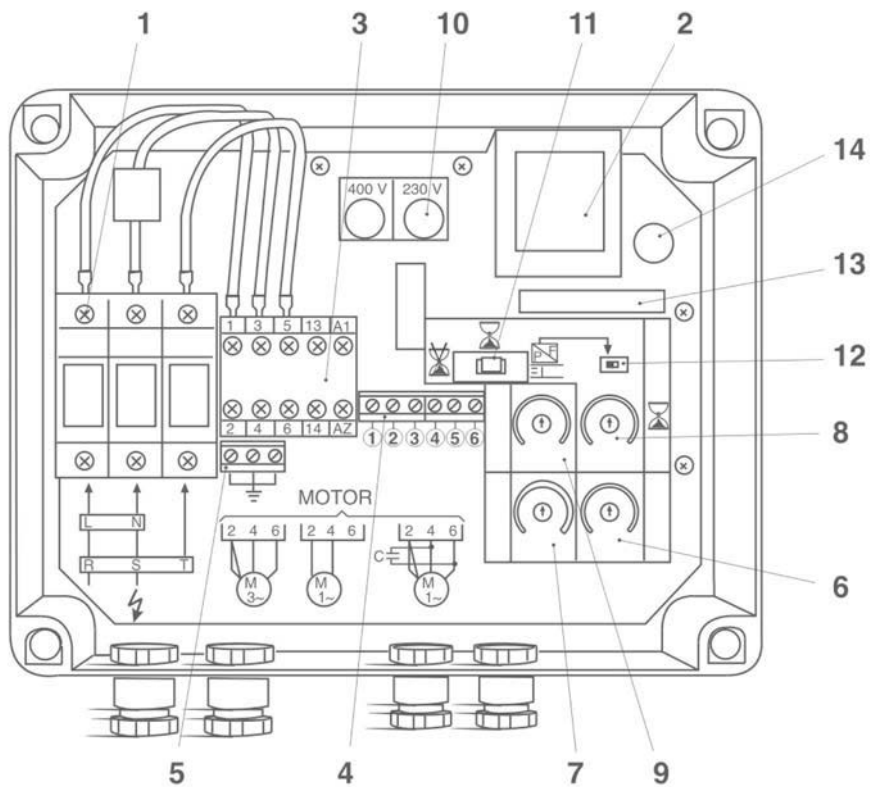
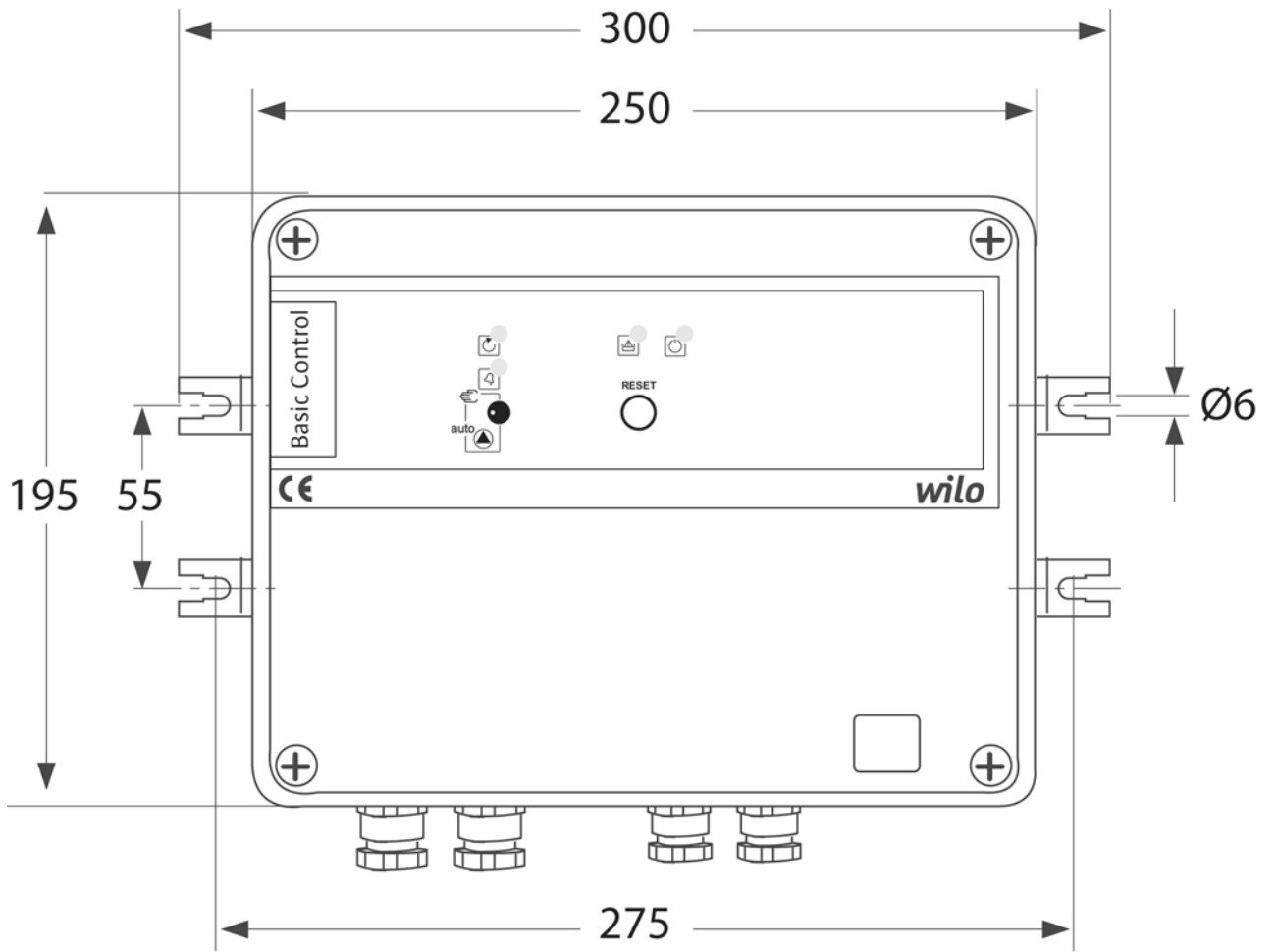


Fig. 3:



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1 General information

About this document

The language of the original operating instructions is German. All other language versions are translations of the original German manual. These installation and operating instructions are an integral part of the product. They must be kept readily available at the place where the product is installed. Strict adherence to these instructions is a precondition for the proper use and correct operation of the product.

These installation and operating instructions correspond to the relevant version of the product and the underlying safety standards valid at the time of going to print.

EC declaration of conformity:

A copy of the EC declaration of conformity is a component of these operating instructions. If a technical modification is made on the designs named there without our agreement or the declarations made in the installation and operating instructions on product/personnel safety are not observed, this declaration loses its validity.

2 Safety

These operating instructions contain basic information which must be adhered to during installation, operation and maintenance. For this reason, these operating instructions must, without fail, be read by the service technician and the responsible specialist/operator before installation and commissioning.

It is not only the general safety instructions listed under the main point "safety" that must be adhered to but also the special safety instructions with danger symbols included under the following main points.

2.1 Symbols and signal words in the operating instructions



Symbols:
General danger symbol



Danger due to electrical voltage



NOTE

Signal words:

DANGER!

Acutely dangerous situation.

Non-observance results in death or the most serious of injuries.

WARNING!

The user can suffer (serious) injuries. 'Warning' implies that (serious) injury to persons is probable if this information is disregarded.



CAUTION!

There is a danger of damaging the product/unit. 'Caution' implies that damage to the product is possible if this information is disregarded.

NOTE:

Useful information on handling the product. It draws attention to possible problems.

Information that appears directly on the product, such as:

- Direction of rotation arrow
 - Identifiers for connections,
 - Rating plate
 - Warning sticker
- must be strictly complied with and kept in legible condition.

2.2 Personnel qualifications

The installation, operating and maintenance personnel must have the appropriate qualifications for this work. Area of responsibility, terms of reference and monitoring of the personnel are to be ensured by the operator. If the personnel are not in possession of the necessary knowledge, they are to be trained and instructed. This can be accomplished if necessary by the manufacturer of the product at the request of the operator.

2.3 Danger in the event of non-observance of the safety instructions

Non-observance of the safety instructions can result in risk of injury to persons and damage to the environment and the product/unit. Non-observance of the safety instructions results in the loss of any claims to damages.

In detail, non-observance can, for example, result in the following risks:

- Danger to persons from electrical, mechanical and bacteriological influences,
- Damage to the environment due to leakage of hazardous materials
- Property damage
- Failure of important product/unit functions
- Failure of required maintenance and repair procedures

2.4 Safety consciousness on the job

The safety instructions included in these installation and operating instructions, the existing national regulations for accident prevention together with any internal working, operating and safety regulations of the operator are to be complied with.

2.5 Safety instructions for the operator

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

- If hot or cold components on the product/the unit lead to hazards, measures must be taken onsite to guard them against touching.
- Guards protecting against touching moving components (such as the coupling) must not be removed whilst the product is in operation.
- Leakages (e.g. from the shaft seals) of hazardous fluids (which are explosive, toxic or hot) must be led away so that no danger to persons or to the environment arises. National statutory provisions are to be complied with.
- Highly flammable materials are always to be kept at a safe distance from the product.
- Danger from electrical current must be eliminated. Local directives or general directives [e.g. IEC, VDE etc.] and instructions from local energy supply companies must be adhered to.

2.6 Safety instructions for installation and maintenance work

The operator must ensure that all installation and maintenance work is carried out by authorised and qualified personnel, who are sufficiently informed from their own detailed study of the operating instructions.

Work on the product/unit must only be carried out when at a standstill. It is mandatory that the procedure described in the installation and operating instructions for shutting down the product/unit be complied with.

Immediately on conclusion of the work, all safety and protective devices must be put back in position and/or recommissioned.

2.7 Unauthorised modification and manufacture of spare parts

Unauthorised modification and manufacture of spare parts will impair the safety of the product/personnel and will make void the manufacturer's declarations regarding safety.

Modifications to the product are only permissible after consultation with the manufacturer. Original spare parts and accessories authorised by the manufacturer ensure safety. The use of other parts will absolve us of liability for consequential events.

2.8 Improper use

The operating safety of the supplied product is only guaranteed for conventional use in accordance with Section 4 of the operating instructions. The limit values must on no account fall under or exceed those specified in the catalogue/data sheet.

3 Transport and interim storage

Immediately after receiving the product:

- Check the product for transport damage.
- In the event of damage in transit, take the necessary steps with the forwarding agent within the respective time limits.



CAUTION! Risk of property damage!

Incorrect transport and interim storage can cause damage to the product.

- **The switchgear is to be protected against moisture and mechanical damage.**
- **It must not be exposed to temperatures outside the range of -10 °C to +55 °C.**

4 Intended use

Switchgear for use as an

- automatic control of single pumps
- Water level control
- Overload protection
- Dry-running protection

Fields of application using electrodes, float switches and pressure switches.

No other devices for other purposes may be installed in the switchgear.

Intended use includes compliance with this manual.

Any other use is regarded as improper use.

5 Product information

5.1 Technical data	
Mains supply voltages	1~ 230 V, 50/60 Hz 3~ 230 V, 50/60 Hz 3~ 400 V, 50/60 Hz
Max. current consumption Wilo-Control	
— ESK1:	1–12 A
— PSK1:	10–23 A
Protection class:	IP 54
Mains fuses	
Control (230/400 V):	0.1 A
Low-voltage component:	0.8 A
Ambient temperature:	–10 to +55 °C

5.2 Scope of delivery

- Switchgear
- Installation and operating instructions
- 2 electrodes
- 4 holders for installation of the switchgear
- Plastic clips and ribbons for the mounting of a capacitor in the cover of the switchgear (for version 1~230 V)

5.3 Accessories (optional)

- Connection cable for electrodes
- External displays (clock, pressure gauge, etc.)
- Direction-of-rotation sensor

6 Description

6.1 Front of the switchgear (Fig. 1)

Item	Element	Function
1	Signal lamp – green	lights up continuously when mains voltage is available
2	Signal lamp – yellow Depends on the selected operating mode: – Displays “low water status” – Lower level reached	lights up continuously when the electrodes are triggered
3	Signal lamp – red Pump fault	lights up continuously when the pump is stopped due to an error.
4	Signal lamp – green Pump in operation	lights up permanently while the pump is running
5	Three-way switch Operating mode	Selecting the operating mode: AUTO Automatic operation with all safety functions, electronic motor protection, low-water protection 0 Off MANU button function
6	Pushbutton	Resets the thermal overload protection

6.2 Single components in the housing (Fig. 2)

Item	Element
1	Thermo-magnetic circuit breaker
2	12 V transformer for low voltage part
3	Motor protection
4	Terminal strip for external sensors (electrode, pressure switch, float switch, external control)
5	Earth contact
6	Variable adjustment of rated motor power in accordance with pump motor rating plate
7	Variable adjustment of electrode sensitivity to the hardness of the water
8	Variable adjustment of time delay for “low water status” display
9	Variable adjustment of time delay for pressure switch/flow meter
10	Fuse (0.1 A) for pre-selected voltage in accordance with pump motor rating plate
11	Protection class selector switch for low water protection
12	On/off switch for time delay when using pressure switch or flow meter
13	Connector for control panel circuit board
14	Fuse holder low voltage fuse (0.8 A)

7 Installation and electrical connection

7.1 Installation

Wall-mounted installation: Dimensions, see Fig. 3

7.2 Electrical connection (Fig. 4a-f)



DANGER! Risk of fatal injury!

When working on the open switchgear, there is a danger of electric shock from touching the live components.

Have the electrical connection established by an electrician approved by the local electricity supply company only and in accordance with applicable regulations.

The current and voltage of the mains connection must correspond to the details on the rating plate of the pump to be connected / of the motor.

- **Adhere to regulations for accident prevention!**
- **Earth the pump/installation in accordance with the regulations.**
- **Mains connection cable for three-phase: 4 x 1.5 mm², for single-phase: 3 x 1.5 mm².**
- Remove the case cover.
- 0.1 A Insert fuse into the corresponding holders for the used voltage: 230 V or 400 V (Fig. 2, item 10).

7.2.1 Connection of the pump motor (Fig. 2)



DANGER! Risk of fatal injury!

Poor earthing can lead to electric shock.

- **Connect the earthing cable with the terminal strip (Fig. 2, item 5)**

Three-phase 400 V:

Four-core cable (3 phases + earth) on contact (item 3) to terminals 2-4-6

Single-phase 230 V:

Three-core cable (1 phase + neutral + earth) on contact (item 3) to terminals 2-4

7.2.2 Connect external elements



DANGER! Risk of fatal injury!

Poor earthing can lead to electric shock.

- **Connect the earthing cable with the terminal strip (Fig. 2, item 5)**
- **Do not connect an external voltage to terminal strip (Fig. 2, item 4).**

It is possible to perform remote control using an external control element (pressure switch, control, level control, etc.). Connection via a two-core cable \varnothing 0.75 mm² to the terminals 5 + 6 of the terminal strip (see Fig. 2; item 4); beforehand, remove the bridge between terminals 5 + 6. Connect the cable to the terminal strip based on the intended application (see Fig. 2, item 4 and Fig. 4; see Chapter 6.3).

7.2.3 Mains connection



DANGER! Risk of fatal injury!

Poor earthing can lead to electric shock.

- **Connect the earthing cable with the terminal strip (Fig. 2, item 5)**

Three-phase 400 V (230 V):

Four-core cable (3 phases + earth) \varnothing 1.5 mm² to terminals R-S-T.

Single-phase 230 V:

Three-core cable (1 phase + neutral + earth) \varnothing 1.5 mm² to terminals L-N.

8 Commissioning



CAUTION! Risk of malfunctions!

If power consumption falls below 1 A during operation, (idling power), reset the device by pressing the 'RESET' button (Fig. 1, item 6).

8.1 Selecting the operating mode

A 3-way selector switch (button) is used to select the operating mode on the front of the switchgear (Fig. 1; item 5):

"MANU" (button) position: the system is manually controlled, regardless of the level setting or external control components.

Position "0": the pump cannot operate. It remains deactivated in all circumstances.

Position "AUTO": the pump operates automatically based on the selected system.

8.2 Settings and tests

8.2.1 Overload protection



DANGER! Risk of fatal injury!

Make all settings when the pump is deactivated.

- Set the potentiometer (Fig. 2, item 6) to the rated motor power specified on the rating plate (or for submersible pumps, on the equipment label near the switchgear).
- Set three-way switch (Fig. 1, item 5) to 'AUTO' – the green signal lamp lights up and the pump starts.

If the fault light comes on within 3 minutes, the rated power is set too low.

- Before changing settings, check the motor power consumption and the connections.
- Reset the rated power based on the determined values.

8.2.2 Check direction of rotation (3-phase motor only)

Keep three-way switch (Fig. 1, item 5) at the position 'MANU' (the 'Mains voltage' signal lamp lights up). When there is a signal (float switch, electrode, etc.), the pump starts.

For direction-of-rotation control, follow the instructions for commissioning the pump.

If the direction of rotation is incorrect:

- Switch off the plant
- Switch two phases in the switchgear.

8.3 Selecting the operating mode

Depending on the application, an operating mode must be set.

8.3.1 Installation with two electrodes (Fig. 4a)

- Select low-water protection (Fig. 2, item 11)
- Configure the sensitivity of the electrodes
Before the pump is started, set the water conductivity potentiometer (Fig. 2, item 7) to the minimum value.
Make sure that the electrodes are immersed and the three-way switch (Fig. 1, item 5) is set to position 'AUTO'. Slowly turn the potentiometer (Fig. 2, item 7) clockwise until the pump starts.
- Applying the electrodes (see the pump operating instructions)



NOTE:

The lower electrode reports low water. The upper electrode must be immersed in order to reset this error.

8.3.2 Installation with one electrode (Fig. 4b)



CAUTION! Risk of malfunctions!

Select low-water protection (Fig. 2, item 11)!

- Configure the sensitivity of the electrode
Before the pump is started, set the water hardness potentiometer (Fig. 2, item 7) to the minimum value.
Make sure that the electrodes are immersed and the three-way switch (Fig. 1, item 5) is set to position 'AUTO'. Slowly turn the potentiometer (Fig. 2, item 7) clockwise until the yellow signal lamp (Fig. 1, item 2) starts to flash.
- Set the time delay before restarting
After stopping due to low water, the pump will start with a delay (1 to 30 minutes).
The delay is preset in the potentiometer (Fig. 2, item 8).
During the waiting period, the yellow signal lamp flashes (Fig. 1, item 2).
- Applying the electrode (see the pump operating instructions)

8.3.3 Installation with flow meter (Fig. 4c)



CAUTION! Risk of malfunctions!

Set water hardness potentiometer to its maximum value (Fig. 2, item 7)!

- Select low-water protection (Fig. 2, item 11).
- Set the time delay before restarting
After stopping due to low flow rates, the pump will start with a delay (1 to 30 minutes). This delay allows for sufficient filling of the water tank before a restart.
The delay is preset in the potentiometer (Fig. 2, item 8).
During the waiting period, the yellow signal lamp flashes (Fig. 1, item 2).
- Configure the time delay before a restart (Fig. 2, item 9)
To provide the flow meter with enough time to record a sufficient flow rate, a minimum period operating time (5 seconds to 3 minutes) is configured for the pump. If the flow meter has not been activated after this time has elapsed, the pump will stop.
- Activating the time delay functions (Fig. 2, item 12)
"AUT" position:
Both delays are active
"MAN" position:
The restart is triggered by pressing the 'Reset' button (Fig. 1, item 6).



CAUTION! Risk of malfunctions!

Make sure that the bridge between terminals 5 + 6 on the terminal strip (Fig. 2, item 4) is correctly positioned.

8.3.4 Pumping operation



CAUTION! Risk of malfunctions!

Set water conductivity potentiometer to its maximum value (Fig. 2, item 7)!

Operation with one float switch (Fig. 4d)

- Select low-water protection (Fig. 2, item 11).
In this position, the float switch is connected to terminals 5 + 6 of the terminal strip (Fig. 2, item 4).
- Connect a protection switch (as dry running protection) to terminals 1 + 3 of the terminal strip.
- Set the time delay before restarting
After stopping due to low water, the pump will start with a delay (1 to 30 minutes).
The delay is preset in the potentiometer (Fig. 2, item 8).
During the waiting period, the yellow signal lamp flashes (Fig. 1, item 2).

Operation with two float switches (Fig. 4e)

- Select low-water protection (Fig. 2, item 11).
In this position, the device only activates the pump and the yellow signal lamp (Fig. 1, item 2) displays the filling phase.

**CAUTION! Risk of malfunctions!**

Make sure that the bridge between terminals 5 + 6 on the terminal strip (Fig. 2, item 4) is correctly positioned.

8.3.5 Pressure boosting (Fig. 4f)**CAUTION! Risk of malfunctions!**

Set water hardness potentiometer to its maximum value (Fig. 2, item 7)!

Float switch in the tank + pressure switch

- Select low-water protection (Fig. 2, item 11).
In this position, the pressure switch is connected to terminals 5 + 6 of the terminal strip (Fig. 2, item 4).
- Set the time delay before restarting
After stopping due to low water, the pump will start with a delay (1 to 30 minutes).
The delay is preset in the potentiometer (Fig. 2, item 8).
During the waiting period, the yellow signal lamp flashes (Fig. 1, item 2).

Pressure switch in the inlet pipe + pressure switch

- Select low-water protection (Fig. 2, item 11).
In this position, the pressure switch is connected to terminals 5 + 6 of the terminal strip (Fig. 2, item 4).
- Set the time delay before restarting
After stopping due to low water, the pump will start with a delay (1 to 30 minutes).
The delay is preset in the potentiometer (Fig. 2, item 8).
During the waiting period, the yellow signal lamp flashes (Fig. 1, item 2).

9 Maintenance**DANGER! Risk of fatal injury!**

When working on the open switchgear, there is a danger of electric shock from touching the live components.

- **Before maintenance and repair work, disconnect the system from the power supply and make sure it cannot be switched on by unauthorised persons.**

10 Faults, causes and remedies

Have faults remedied by qualified personnel only! Follow the safety instructions in Chapter "Safety"!

Fault	Causes	Remedy
The pump does not start or constantly stops working	<ul style="list-style-type: none"> • Faulty mains connection • The fuse for the pre-selected voltage (Fig. 2, item 11) has been inserted incorrectly or is defective • Operating mode in position '0' • The circuit for external control has been interrupted • No electrodes, float switches or bridges are connected 	<ul style="list-style-type: none"> • Reconnect a mains connection with the appropriate available voltage. • Insert fuse into the correct holder. If necessary, replace the fuse. • Place the switch (Fig. 1, item 5) into position 'AUTO'. • Close the circuit or check for presence of the bridge (terminals 5 + 6 of the terminal strip) • Connect electrodes, float switch or bridge, depending on the application (Figs. 4a-f)
Pump fault at pump start)	<ul style="list-style-type: none"> • Contactor problem • Faulty cabling/wiring 	<ul style="list-style-type: none"> • Check relays. • Check cabling/wiring.
Pump fault Continuous fault indication	<ul style="list-style-type: none"> • Thermal protection switch (Fig. 2, item 1) triggered 	<ul style="list-style-type: none"> • Check whether the configured rating matches the rating specified on the motor rating plate. • Reset the fault using the "RESET" switch. If the fault remains, contact the Service contact.
Faulty automation	<ul style="list-style-type: none"> • Faulty earthing connection • Exceptionally soft water • Time delay set to '0' 	<ul style="list-style-type: none"> • Check the earthing connections and mass contacts of the pump • Check setting (see § 6.3.1.1). • Check the operation and setting of time delay.
The pump starts up but the flow rate is too low	<ul style="list-style-type: none"> • The rotation speed is too low • Incorrect direction of rotation 	<ul style="list-style-type: none"> • Check the power supply and motor connection. • Switch two phases!

11 Spare parts

All spare parts must be ordered directly from the Wilo customer service.

To avoid queries and incorrect orders, all data from the rating plate must be specified with every order.

The spare parts catalogue can be found at the following address: www.wilo.com.

Subject to change without prior notice.



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